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ABSTRACT:

Tribological Behavior of Active Screen Plasma-Nitrided Offshore Materials

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This talk summarizes the main results obtained under the scenario of "Program of excellence in Surface Engineering with emphasis on Plasma-Assisted treatments" developed in the Paraná State, Brazil. Plasma nitriding was investigated as a potential solution to increase the wear resistance of offshore materials, without loss in their corrosion performance. The application of active screen technique is one of the possible routes for that purpose. To achieve a better comprehension of the topic, three recent researches were organized in the following order:

- a comparison of processes using a relative low-cost substrate [1];
- a comparison between two grades of duplex stainless steels [2]; and
- the effect of counterbody on the wear of a usual superalloy employed in critical situation on offshore structures [3].

Although some limitations of active screen process can be identified, the performance of layers deposited using this technique reveals a very promising application in reducing material costs. The nitriding of intermediate cost offshore materials can be turn them equivalent in performance to the noble ones.

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[3] Y. I. Oikava, B. C. S. Kurelo, G. Pintaude, V. T. Mazur, X. Li, H. Dong, Tribol. Lett., 71, 116 (2023).